

Remarks

An amendment presenting rejected claims in better form for consideration on appeal may be admitted. *See* 37 C.F.R. § 1.116(b)(2). Accordingly, reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-48 are pending in the application, with claims 1, 17, and 33 being the independent claims. Claims 1-3, 8, 9, 12, 13, 15-19, 24, 28, 29, 31-33, 35, 40, 44, and 45 are sought to be amended. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Rejections under 35 U.S.C. § 102

The Examiner rejected claims 1, 2, 8-11, 17, 18, 24-27, 33, 34, and 40-43 under 35 U.S.C. § 102(e) as being allegedly anticipated by U.S. Patent No. 6,401,147 to Sang *et al.* ("Sang"). Based on the foregoing amendments and the following remarks, Applicant respectfully traverses.

As currently amended, claim 1 recites an apparatus comprising:

a first buffer memory of a first type to store data associated with a connection identifier corresponding to a channel in a network, the data being organized into at least one chunk based on a linked list, the at least one chunk comprising at least one chunk data block, the connection identifier identifying a connection in the channel, the data being part of a data stream of a packet associated with the connection, the packet having a defined packet size;

a packet memory of a second type coupled to the first buffer memory and configured to store the at least one chunk data block;

a second buffer memory of the first type coupled to the first buffer memory and the packet memory, and configured to store the at least one chunk data block; and

a write circuit (i) to write the at least one chunk data block to the packet memory in response to a transfer condition if the packet size indicates the packet is long, and (ii) to write the at least one chunk data block to the second buffer memory in response to the transfer condition if the packet size indicates the packet is short.

Sang does not teach or suggest each and every feature of claim 1. Sang is directed to a split-queue architecture. (*See Sang at the Title.*) The split-queue architecture includes a queue write side 410, a queue read side 412, and a queue overflow storage area 414. (*See Sang at FIG. 4.*) Entries are received in the queue write side 410. (*See Sang col. 10, l. 66.*) Although Sang appears to teach that the entries may be written to either the queue read side 412 or the queue overflow storage area 414 (*see Sang at col. 11, ll. 8-65*), Sang does not teach or suggest, for example, a write circuit as recited in claim 1.

In claim 1, the at least one chunk data block is written to either the packet memory or the second buffer memory based on a characteristic of *the received packet*, namely the packet size. In stark contrast, Sang teaches that entries are written to either the queue read side 412 or the queue overflow storage area 414 based on a characteristic of *the split-queue architecture*, namely an amount of data in the split-queue architecture — and not based on a characteristic of the received entries. In particular, Sang states that

[i]f there is space in the queue read side 412, and the overflow storage area 414 for that queue 400 is empty, then one or more entries are passed directly from the queue write side 410 to the queue read side 412 along the path designated by the reference numeral 418. ...

If the queue read side 412 is full, and there is at least a burst-size amount of data ... in the queue write side 410, then the data is written in a burst fashion into the overflow storage area 414 for the queue 400. ... If the queue read side 412 is full, but there is not yet a burst-size amount of data in the queue write side 410, then the entry remains in the queue write side 410 and nothing further is done. Eventually, the queue read side 412 will empty, and when the queue read side 412 has enough space to accommodate a burst-size amount of data, and there is data in the overflow storage area 414, a burst of data is provided from the overflow storage area 414 into the queue read side 412.

(Sang col. 11, ll. 9-14, 19-22, 26-34; *see also* Sang at FIG. 7, items S714, S716, S718, S724, S726, and S728.) Thus, Sang does not teach or suggest, for example, “a write circuit (i) to write the at least one chunk data block to the packet memory in response to a transfer condition if the packet size indicates the packet is long, and (ii) to write the at least one chunk data block to the second buffer memory in response to the transfer condition if the packet size indicates the packet is short,” as recited in claim 1.

Because Sang does not teach or suggest each and every feature of claim 1, this reference cannot anticipate claim 1. Independent claim 17 (which is a method claim corresponding to the apparatus recited in claim 1) and independent claim 33 (which is a system claim corresponding to the apparatus recited in claim 1) have been amended to recite similar claim features to independent claim 1. Accordingly, independent claims 17 and 33 are also patentable over Sang for at least the same reasons as independent claim 1, in addition to their own respective features. Thus, Applicant respectfully requests that the Examiner’s rejection of independent claims 1, 17, and 33 under 35 U.S.C. § 102(e) be reconsidered and withdrawn.

Dependent claims 2 and 8-11, dependent claims 18 and 24-27, and dependent claims 34 and 40-43 depend, either directly or indirectly, from independent claims 1, 17,

and 33, respectively. Accordingly, dependent claims 2, 8-11, 18, 24-27, 34, and 40-43 also cannot be anticipated by Sang for at least the same reasons as set forth above with respect to the independent claims, in addition to the respective features of the dependent claims. Thus, Applicant respectfully requests that the Examiner's rejection of dependent claims 2, 8-11, 18, 24-27, 34, and 40-43 under 35 U.S.C. § 102(e) be reconsidered and withdrawn.

Rejections under 35 U.S.C. § 103

The Examiner has rejected claims 3-7, 19-23, and 35-39 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Sang in view of U.S. Patent No. 6,542,502 to Herring *et al.* ("Herring"). Based on the foregoing amendments and the following remarks, Applicant respectfully traverses.

As set forth above, Sang does not teach or suggest each and every feature of independent claims 1, 17, and 33. The shortcomings of Sang with respect to the independent claims are not remedied by the teachings of Herring. For example, like Sang, Herring also does not teach or suggest "a write circuit (i) to write the at least one chunk data block to the packet memory in response to a transfer condition if the packet size indicates the packet is long, and (ii) to write the at least one chunk data block to the second buffer memory in response to the transfer condition if the packet size indicates the packet is short," as recited in claim 1.

Herring is directed to "a replication method" that solves the "deadlock" problem that occurs in "wormhole routing multicast methods." (See Herring at the Abstract; col. 1, ll. 9-10.) According to Herring, "[i]n wormhole routing, flow control is performed on units that are smaller than packets: flow-control digits, or 'flits'." (See Herring col. 1, ll.

11-12; FIG. 1.) Herring describes the deadlock problem associated with wormhole routing in the following manner:

The header (first flit) of the packet advances immediately through each switching element (switch) unless it is blocked because of contention for an output port. . . When the packet header is blocked, all flits of the packet are buffered in place until the output port is free. Thus, a single blocked packet may be blocked in place across many switches.

(Herring col. 1, ll. 15-23.)

To solve this deadlock problem, Herring uses a distributed memory machine from IBM, called an IBM SP2 (RISC System/6000 Scalable POWERparallel System). (See Herring col. 2, ll. 22-68.) Although Herring describes a data chunking method (see Herring col. 3, ll. 6-22), the IBM SP2 is equipped with only a single central buffer, not “a first buffer memory of a first type,” “a packet memory of a second type,” and “a second buffer memory of the first type,” as recited in claim 1. Thus, Herring cannot possibly teach or suggest, for example, “a write circuit (i) to write the at least one chunk data block to the packet memory in response to a transfer condition if the packet size indicates the packet is long, and (ii) to write the at least one chunk data block to the second buffer memory in response to the transfer condition if the packet size indicates the packet is short,” as recited in claim 1.

Furthermore, Herring tends to teach away from using a write circuit that writes to either the packet memory or the second buffer memory as recited in claim 1. In particular, Herring acknowledges a drawback associated with the IBM SP2, specifically stating that

[b]ecause there is no assurance that the central buffer can store an entire multideestination packet, the central buffer as

implemented in SP2 cannot guarantee to prevent [sic] multicast deadlock.

(Herring col. 2, ll. 42-45.) Despite this drawback, Herring advocates using only a single central buffer because “an SP2-like shared central buffer is an extremely attractive resource for packet replication.” (Herring col. 2, ll. 45-46.) Thus, Herring teaches the use of a single central buffer — not “a first buffer memory of a first type,” “a packet memory of a second type,” and “a second buffer memory of the first type,” as in claim 1.

Because Sang and Herring, alone or in combination, do not teach or suggest each and every feature of claim 1, this claim is patentable over Sang and Herring. Independent claims 17 and 33 are also patentable over Sang and Herring for at least the same reasons as set forth above with respect to claim 1, in addition to their own respective features. Dependent claims 3-7, dependent claims 19-23, and dependent claims 35-39 depend, directly or indirectly, from independent claims 1, 17, and 33, respectively. Accordingly, dependent claims 3-7, 19-23, and 35-39 are patentable over Sang and Herring for at least the same reasons as the independent claims, in addition to their own respective features. Thus, Applicant respectfully requests that the Examiner’s rejection of claims 3-7, 19-23, and 35-39 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for

Reply to Office Action of February 22, 2007

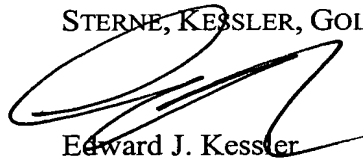
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allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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